INLAND FLOOD DAMAGE REDUCTION BREAKOUT SESSION

DFW Hyatt

21-23 March 2001

Breakout Session Members

Districts/Divisions/Guests

- Bill Barron, Nashville
- Steve Monte, North Atlantic Division
- Jim Pennaz, Honolulu
- Meg Jonas, Baltimore
- Bill Espy, Espy Consultants
- Forrest Holly, IIHR
- Claude Strauser, St. Louis
- Joe Dixon, Los Angeles
- Frank Santangelo, New York
- Chuck Wener, New England
- John Carroll, Sacramento
- Jim Blanchar, Rock Island

HQ, Labs

- David Biedenharn, CHL
- Harold Britton, TEC
- Tom Richardson, CHL
- Darryl Davis, HEC
- Arlen Feldman, HEC
- Ron Conner, CECW-OE
- Mike Kidby, CECW-OD
- Kate White, CEERD-RT

- Facilitator:
  Don Bergner, South Pacific Division

Introduction

- The present group is a limited representation of the inland flood damage reduction community - therefore, more widespread dissemination and input is required before this list can be considered to represent Corps-wide needs and priorities
- The results presented here derive from this brainstorming session and the earlier LAN brainstorming

Brainstorming Goals

- Identify research and development opportunities related to inland flood damage reduction
- Prioritize R&D areas identified
- Provide input to HQUSACE
  - FY02 investment strategy
  - FY03 budget development

INLAND FLOOD DAMAGE REDUCTION BUSINESS PRACTICE

MAJOR GOAL*:

Reduce, through an integrated program of structural and nonstructural means, the adverse economic, social, and environmental consequences to the Nation resulting from inland flooding

* Flood Damage Reduction Murder Board

Inland Flood Damage Reduction

Future Operating Capabilities*

1. REDUCE LIFE-CYCLE COSTS of system and unit infrastructure

2. Improved system monitoring, early-warning forecasting, operation, and response to REDUCE LOSS OF LIFE AND DAMAGE due to flooding and storms

3. WATERSHED/REGIONAL MANAGEMENT to optimize function of system, reduce costs, and increase benefits for multipurpose projects

* Flood Damage Reduction Murder Board

Topics

1. physical processes
2. remedial and mitigation measures
3. built environment
4. natural environment
5. human consequences
6. monitoring and maintenance
7. emergency management
8. planning analysis process
9. policy from a Federal perspective

Ranking Procedure

- Consider all issues raised with the understanding that some may belong elsewhere
- Votes by all but ERDC/HEC/HQ personnel
- No opinion=no vote
- Ranked by Σ(High + Medium)
- Ties broken by largest number of highs
- Final ranking will be done after FRG members respond

1. Physical processes 1/4

1. improve 2D hydrodynamic/sediment transport models 8H 4M 0L
2. sediment transport for ungaged/flashy basins 6H 6M 0L
3. hydrologic/hydraulic impacts of wetlands 6H 6M 1L
4. physical processes related to biostabilization of streambanks 6H 6M 0L
5. system and local effects of stabilization structures 5H 7M 1L
6. urban flooding (exceeding drainage capacity, combined systems) 9H 2M 1L

1. Physical processes 2/4

7. urban flooding (stream restoration) 8H 3M 0L
8. extension of forecast horizon (radar, physical models, RS/GIS) 5H 6M 0L
9. better spatial definition of hydrologic and sediment processes 6H 4M 2L
10. probabilistic forecasts 3H 7M 0L
11. effects of removal of structures (e.g., dams) 5H 4M 4L
12. fate and transport of contaminated sediment 4H 5M 3L
13. urban flooding (WQ issues) 5H 4M 1L

1. Physical processes 3/4

14. hydrologic effects of manipulating floodplain properties 2H 7M 3L
15. flow-duration for ungaged watersheds 3H 5M 4L
16. low flow hydrology 4H 3M 3L
17. improve SAM (relative stability of the family of stable channel solutions) 4H 3M 5L
18. debris flows (frequency and quantity) 4H 3M 5L
19. tidal/fluvial correlation (e.g., interior drainage) 2H 5M 4L
20. effects of ice on inland flooding 5H 1M 5L
21. tool to identify defining event for channel morphology 4H 2M 5L

1. Physical processes 4/4

22. rapid (hrs-days-months) H&H modeling for unmodeled streams 2H 4M 4L
23. quantify morphological and environmental benefits 2H 4M 6L
24. surface water/groundwater interactions for range of flow conditions 1H 4M 5L
25. long range (≈3 months) sediment forecasting 1H 4M 6L
26. definition of natural streambanks H 4M 6L
27. level of sophistication in characterizing physical processes 0H 1M 9L

2. Remedial and mitigation measures (1/3)

1. EM/O&M Manual for bioengineered projects 10H 3M 0L
2. stream restoration forensics (lessons learned and design guidance) 7H 6M 0L
3. environmentally-friendly flood damage reduction measures 7H 5M 1L
4. physical processes related to biostabilization of streambanks (selection and design criteria) 6H 5M 1L
5. engineered wetlands to improve WQ/habitat 6H 5M 2L

2. Remedial and mitigation measures (2/3)

6. bank protection and grade control tech transfer 3H 8M 1L
7. reduction of watershed sediment yield/pollutants through channel stabilization 3H 7M 2L
8. improve stable channel design techniques watershed approach to stabilization 3H 6M 3L
9. ice retention structures 7H 1M 2L
10. effects of dam removal 5H 3M 4L
11. urban stream corridor restoration (dredging for WQ) 3H 5M 3L

2. Remedial and mitigation measures 3/3

12. update of nonstructural measures 4H 2M 6L
13. impact of reservoir operations on streambank erosion 1H 5M 0L
14. dynamic flow management/operation rule 1H 3M 4L
15. improved guidance on multipurpose structures 1H 3M 5L
16. resource banking (e.g., wetlands, sediment, detention) 1H 3M 6L
17. evaluating the environmental benefits of floodplains 2H 1M 5L
18. perennial vs ephemeral 1H 0M 6L

3. Built environment (1/3)

1. Hydrologic/ice impacts of climate change on existing flood control infrastructure 5H 5M 2L
2. update damage functions for life-line infrastructure 3H 7M 1L
3. land-use forecasting for H&H 3H 5M 3L
4. ice effects 5H 2M 3L
5. integrate/evaluate national databases of infrastructure, biological resources, cultural resources etc 2H 5M 4L
6. statistical sampling or estimation procedures for flood damage 1H 6M 3L

3. Built environment (2/3)

7. guidance for use of setback levees 3H 3M 1L
8. removal of structures 3H 2M 5L
9. explore addition of hydropower to existing facilities H 4M 6L
10. update built environment data on regular basis 1H 3M 7L
11. national database of census data at the block level 1H 3M 7L
12. low-cost construction methods for flood walls 1H 2M 4L

3. Built environment (3/3)

13. operation of flood control infrastructure during loss of power/other services 1H 0M 10L
14. techniques to evaluate basement flooding affected by sewage backup 0H 0M 6L

4. Natural environment

1. hydrologic and water quality effects of wetlands 6H 5M 1L
2. defining environmental outputs 5H 5M 2L
3. roughness coefficients for wetland vegetation 3H 6M 3L
4. flood-induced morphological and other changes in floodplains 3H 5M 4L
5. characterizing natural channel 4H 3M 5L
6. freeze-thaw impacts 2H 5M 3L
7. ice effects 5H 1M 5L
8. characterizing geological floodplain 3H 2M 6L

5. Human consequences (1/2)

1. communicate H&H processes, including risk & uncertainty to public 8H 5M 0L
2. inclusion of loss-of-life valuations/determinations 4H 4M 3L
3. social consequences of structural and nonstructural flood control projects 2H 5M 6L
4. integration of appropriate recreation or environmental education facilities 2H 3M 7L
5. informational guide describing ecologically friendly flood damage reduction projects 3H 1M 4L
6. update FDR to allow innovative property acquisition (e.g., temporary easements) 1H 4M 3L

5. Human consequences (2/2)

7. evaluation of evacuation as advance measure 1H 2M 5L
8. H&H project impacts on Federally-recognized tribes 0H 1M 8L
9. emergency shelter environment 0H 0M 7L

6. Monitoring and maintenance (1/2)

1. long-term impacts of ecosystem projects on flood conveyance 7H 6M 0L
2. incorporation of post-project monitoring capabilities in design 8H 4M 0L
3. environmental restrictions on flood control channel maintenance 6H 6M 0L
4. low-cost, robust instrumentation to support real-time data collection 5H 7M 0L
5. post-project evaluation of flood control project performance 7H 4M 2L
6. collection of HWM/damage data after flood events (instrumentation, improved methods) 6H 5M 0L

6. Monitoring and maintenance (2/2)

7. design short- and long-term monitoring for ecosystem restoration projects 6H 5M 2L
8. sediment transport data collection 4H 7M 0L
9. performance of aging flood control projects 7H 3M 3L
10. real-time stream-gaging capabilities 5H 5M 1L
11. bed-load and suspended sediment measurement techniques 5H 3M 4L
12. remote monitoring of ice jams 5H 1M 2L

7. Emergency management (1/2)

1. flood-fighting forensics 9H 2M 1L
2. real-time forecasting for EM 7H 1M 1L
3. integration of EM and FDR processes 5H 5M 1L
4. real-time flash-flood forecasting 5H 4M 1L
5. integration of EM information management systems 5H 3M 4L
6. improve expedient flood-fighting techniques 3H 4M 4L
7. incorporation of flood-fighting techniques in recon-level studies 1H 4M 8L
8. advance measure analysis techniques 1H 1M 3L

7. Emergency management (2/2)

9. effectiveness of various notification measures
   1H 1M 5L
10. effectiveness of emergency response measures over time 1H 1M 7L
11. effect of climate change on emergency measures 0H 1M 9L

8. Planning analysis process

1. visualization in support of planning 8H 4M 0L
2. valuing environmental outputs 8H 4M 1L
3. plan formulation/evaluation analytical tools 6H 5M 0L
4. multi-objective planning 5H 3M 2L
5. integration of analytic tools 6H 1M 0L
6. consideration of TMDL 4H 2M 2L
7. update statistical software to 21st century 1H 4M 2L
8. methods for evaluating off-site benefits 2H 2M 4L
9. uncertainty of operations due to non-water resource requirements H 0M 8L

9. Policy from a Federal perspective

1. publicizing technically excellent Corps projects 12H 0M 0L
2. recreation policy 7H 5M 0L
3. claiming loss-of-life benefits 8H 4M 1L
4. multi-agency watershed studies 4H 8M 0L
5. 800-cfs rule 10H 0M 0L
6. 1% spending rule for monitoring 7H 3M 1L
7. environmental education as stand-alone project output 6H 1M 4L
8. quantification of project performance augmentation by flood-fighting (viz., FEMA criteria) 3H 3M 3L